The Business Model

Access to broadband services for all of the Commonwealth's residences and businesses is critical to the future of Virginia and to the quality of life of all Virginians. The effort to expand economic development opportunities by promoting broadband access is an integral part of the state's economic development mission and supports the state's efforts toward job creation, business expansion, community empowerment, and individual and personal growth. Broadband also is key to health and safety, enhancing statewide access to critical medical services and greatly augmenting public safety capabilities and outcomes. Consequently, assisting local communities to identify and develop business models to finance deployment and provide long-term sustainability for broadband is a major focus of the Broadband Roundtable.

The expansion of broadband services to all areas of the Commonwealth is much like the advent of rural electrification. Early in the last century, electric service was regarded as a luxury only available to the rich and to the well located. Holes in electric service dotted the landscape and rural residents were the last to benefit from the advances being made by the new technology. After electricity providers failed to address the needs of unserved rural communities, coordinated efforts by localities and the private sector resulted in the creation of rural cooperatives, electric authorities, and other joint approaches to drive the full deployment of electricity to all parts of the Commonwealth. Such too is the case with the technology for high-speed access.

Traditional broadband providers have been highly successful in meeting the needs of densely populated areas across the Commonwealth. Many Virginia cities and urbanized corridors have multiple providers competing and offering a wide array of technological services and products. Unfortunately, there remain large populations in too many communities, both rural and suburban, that are unserved or underserved. This absence of access contributes to the widening of the digital and economic divide. State efforts through the Tobacco Commission and the Department of Housing and Community Development (DHCD) have helped close the existing gap but additional efforts are necessary.

Like rural electrification, rural and suburban communities are recognizing the benefits of broadband access and are moving forward on their own to provide access to their residents and businesses. Case studies of these efforts form the basis for this section of the *Report* of the Broadband Roundtable.

Community Case Studies

Case studies from communities across Virginia have been shared with the Broadband Roundtable and have been incorporated into this section of the *Report.*

Following its formation in June 2007, the Broadband Roundtable received testimony from localities across Virginia of community-based efforts for broadband deployment. From oral presentations to site visits, Roundtable members learned firsthand the innovative approaches used by localities to deliver broadband service to residences, businesses, schools, and government facilities. Local community leaders, representatives from the private sector, and government professionals have shared information of their successes and failures and contributed valuable input to a report that hopefully will serve as a blueprint for advancing the Governor's goal of ensuring broadband access to residents and businesses statewide.

Moreover, the Virginia legislative Joint Commission on Technology and Science (JCOTS) also shared with the Roundtable its findings on broadband and has collaborated with the Roundtable in the development of legislation and other actions to advance and sustain broadband service.

In addition to presentations made to the Roundtable, the Business Model Committee, working jointly with the Virginia Resources Authority (VRA), requested and received information from local communities detailing their individual efforts to address broadband gaps in their communities. VRA posed several questions to chief executive officers of communities identified by the Center for Innovative Technology (CIT) as having implemented a local strategy for broadband deployment. These questions allowed the community to provide its own description and project assessment and to recount, for the benefit of others, specific challenges faced in the delivery of broadband service. Communities were also asked to include copies of any ordinances and/or resolutions adopted by the governing board, agreements, RFPs, RFQs, and financing contracts.

VRA's questions included:

1. Who drove the broadband initiative (region, local government, residents, private sector)?
2. What technology was used?
3. What, if any, legal entity was formed (wireless authority, public private partnership, etc.)?
4. How was the initiative funded?
5. Were any state or local assets leveraged (towers, rights-of-way, etc.)?
6. What, if any, barriers were encountered?
7. What is the status of the project?

Several communities responded to the request for information and their case studies from these communities are incorporated into this report. Responding Virginia communities include: Accomack-Northampton PDC, the Appomattox, Arlington, Bland County, Bristol, Clarksville, Danville, Dickenson County, Franklin County, Highland County, King George County, LENOWISCO, Manassas, Mathews County, Northern Neck PDC, Page County, Patrick County, Prince George County. In addition examples

of projects in Pennsylvania, Kentucky and Texas are included with background supporting documents.

Analysis of Case Studies

From wireless technology to major investment in fiber infrastructure, Virginia communities are utilizing various technologies to provide broadband service. They are also employing various business arrangements to finance and support the service. This section reviews those arrangements and focuses on their commonalities as well as their differences. It examines who drove the process, how universal community assets were used to leverage and support broadband deployment, how existing utility operations can be incorporated, and alternative funding mechanisms used. All of the case studies highlight the need to encourage and promote local engagement as an important part of any broadband deployment activity.

Driving the Initiative

From local business leaders to Parent Teachers Associations, the call for universal connectivity can come from any segment of the community. Community groups, business owners, public safety personnel, educators, medical professionals, and others have recognized that the ability to connect local centers of activity for better service and delivery is important and that it can only be provided through universal access. Further, as more and more people and activity centers are connected, communities are able to grow dramatically through interactions made possible by broadband technology.

In the interest of advancing economic development goals, business and government leaders in several counties led the charge for broadband service. For instance, Franklin County's case study noted that the thirst for broadband in that county sprung from citizens with education and recreation interests, from businesses with expansion interests, and from the county government's desire to link remote offices.

In Appomattox, Bland, Page, and King George counties, the drive for economic development led government and the private sectors to come together for broadband deployment.

Technologies Used

Communities have utilized various technologies to advance local broadband service. Fiber, copper technology (DSL), cable modems, Wi-Fi, wireless, and broadband over powerlines are examples cited in the case studies.

Strengthened by support from Mid-Atlantic Broadband, a fiber optic broadband network over which digital data, voice, and video signals could be transmitted was constructed in the city of Danville. Franklin County formed a wireless mesh network with a local wireless internet service provider to expand the county's local government wide-area network and provide broadband options for citizens. In Appomattox County,

DigitalBridge Communications (DBC), in partnership with Mid-Atlantic Broadband, built one of the first WiMAX broadband wireless networks in the country with no business relationship and no commitment of any service provided to a local government entity. Launched in January 2008, the DBC deployment has made broadband service available to over 1000 homes and over 350 businesses.

In Nelson County, International Broadband Electric Communications, in conjunction with Central Virginia Electric Cooperative, began deployment of their broadband over powerline. Each locality engaged the services of a consultant to assist in determining the technology needed to meet local needs. Consultants working with Prince George County recommended that the County build a wireless network to bring broadband to the unserved areas.

Planning Process

A VRA advisory group of local government executives, including city managers, county administrators, directors of planning district commissions, directors of public utilities, and public safety officials developed a checklist of questions that localities can use to self-assess their community broadband needs, the local leadership approach, core business case elements and financing approaches and options. The checklist is to facilitate a community's self-evaluation of crucial building blocks of a successful and sustainable broadband project. No answers are provided by outside parties, but rather each community can custom design the approach and components that best suit its unique circumstances using the guiding questions in the checklist.

The Community Self-Examination for Broadband Deployment developed by VRA's Community Investment Advisory Council, is shown below:

Community Self-Examination for Broadband Deployment

1. Questions – Local Leadership

-Is broadband needed?
-What's available now?
-Who is making the case for broadband? (actively include in the initiative)
-Who makes this type of decision for the community? (individuals, entities, or some combination thereof)
-Who makes the case of why broadband should be made available?
-Why should broadband be made available?
-Who provides the technical support for planning (procurement, contracting, financing, legal, etc.)?
-Who provides the follow-up/supervision during deployment?

2. Recommended Questions – Core Business Case

-What is the status of current broadband access?

-Where are the gaps (geographic, government, educational, commercial, residential, speed, etc.?
-How long will each of the gaps likely continue?
-What are the assumptions underlying the projections in the question above?
-Which gaps are likely to persist over time?
-Why are the gaps expected to persist?
-What are the current projected customer base(s) in the gap areas?
-What are the assumptions underlying the projections in the question above?
-What are the respective roles of the private sector and the public sector in the options identified?
-What options exist to address the persistent gap?
-What are the strengths and weaknesses of each option listed in the question above?
-What are the 10-15 year projections of revenues and expenses for the business model options under consideration (pro forma)?
-What technology investments are required for each option under consideration?
-What factors could positively affect the revenue and expenditure projections above?
-What factors could negatively affect the revenue and expenditure projections above?

3. Questions – Financing of Broadband Business Models Types

Model Options: Local Wholesale Network Model, Public-Private Partnership, Municipal Public Utility and Others

-Who pays, how much. and when?
-What other infrastructure investments can be leveraged in combination with broadband initiative?
-How can you align your financing with your projected project cash flow?
-Who is financing entity?
-What are the assumed terms and conditions of the financing?
-What are the impacts (real or imagined) to creditworthiness?
-Who assumes the all/partial financial risk and what form does that risk take?
-What are the financial contingencies for the deal----the exit strategy?
-What is the current telecom spend for the public sector participation?
-What option exists to reallocate telecom spend?
-What internal contributions could be available to offset potential costs?
-What grant monies (federal, state, local, private, nonprofit) are available?

In addition to the self-assessment above, a review of the case studies submitted reveals some commonality in approaches utilized by communities to plan for, finance, and implement a strategy for broadband deployment and sustainability. Activities included in the planning process are: the determination of the *system design, technology, and capacity;* a *business plan;* a *financial plan*; and a *plan for ongoing maintenance and sustainability*. Discussion of these components follows:

System Design, Technology and Capacity

Each community determined through a planning process the goals and objectives of the proposed system design. Key components included functional specifications like bandwidth; the number of sites and/or systems that would have to be connected; performance specifications including minimum levels. Also included were broadband standards for systems requiring inter-operability with other networks; and appropriateness and availability of the proposed technological solutions including infrastructure that would be deployed.

Often professional and/or consultative support was needed in making a determination of system design, technology to be utilized, and capacity. Local communities have benefited from the direct assistance provided by the CIT, DHCD, the Tobacco Commission and Mid-Atlantic Broadband, and the Office of Telework within the Office of the Secretary of Technology. Other technical support, particularly that relating to the procurement of services, can be found within the Department of General Services.

Business Plan

Critical to each community's planning process were the essential elements of a business plan, including the need for broadband; description of the community to be served; any existing levels of connectivity currently available and the current cost of those services; a summary of the extent of community engagement to the proposed broadband deployment; details on the potential number of users of broadband access; details on the kind of broadband-dependent services that may be provided as a result of broadband access; overview of the proposed project management; the appropriateness and availability of the proposed technological solution; and a plan for the proposed implementation of the network, including a time line with project milestones and a commitment to adhering to a set critical path.

Financial Plan

The planning process for each community included details of the market and revenue and cost projections to support the sustainability of the proposed broadband services for a period of several years (3-5) including a breakdown of the required costs for deployment.

In developing a financial plan or strategy, each community made assumptions for the expected number of residents and businesses that would have access to the broadband service and revenue estimates based on the number of residents and businesses that had agreed to subscribe to the service for the first year. Additionally, assumptions were made for multi-year subscriber and population growth rate, average revenue per subscriber, measurability, and types of services to be offered. Finally, communities identified

potential risks that could affect implementation of the project and any strategies or solutions that could be used to mitigate or prevent these impacts.

Maintenance and Sustainability

Finally, a determination of the maintenance requirements of the system was extremely vital in the planning process. Answering questions like how long should maintenance support be provided; how will the service be monitored for problems; how with service growth be accommodated; and what software will be used to generate utilization and service availability reports are helpful in assessing costs and sustainability.

Benefits of the Planning Process

Each case study demonstrates that successful and sustainable programs have been developed when there is a coordinated effort between the public and private sectors. A review of these models provides insight into the planning process utilized by communities in assessing the *need for* broadband service, *identifying the technologies* used to deliver broadband service, *business plans* that analyzed the various approaches, and *financial options available* to finance this activity.

Major Business Models for Broadband

Several business models have been identified for broadband deployment. *InfoDev Study On Local Open Access Networks For Communities and Municipalities,* jointly developed by infoDev and The Opian Foundation in 2006, lists and provides highlights for the following:

Local Wholesale Network Model

In this model, the network operator provides a wholesale service where it leases access to the network to service providers that use the network to provide service to their retail customers. In most instances, these open access networks have been financed and are owned by the local government or by a community cooperative. These open access networks are designed to stimulate competition by providing network access to all service providers and reducing the cost of this access. Key features are:

- True broadband capacity
- Serve a local geographic community (housing block, business park, town, etc)
- Can be used by any party located within the community served
- Operated on an open basis

Public-Private Partnership

In this model, the local government enters into an agreement with a private sector firm to operate and manage the network and is the only supplier of services to the end user. The local government may own the network or may enter into an arrangement with a company that will also build and finance the network. The major advantage to this approach is that there is usually less risk to the local government. Providing the technology, equipment, or infrastructure designed to deploy broadband service qualifies for Public-Private Partnership arrangements.

The Virginia Public-Private Education Facilities and Infrastructure Act of 2002, as amended, (PPEA) is the legislative framework enabling localities and other public bodies to enter into agreements authorizing private entities to develop and/or operate qualifying projects.

The Act grants responsible public entities the authority to create public-private partnerships if the public entities determine there is a need for such projects. Public entities may also determine that private involvement may provide the project in a more timely or cost effective fashion, lead to productivity or efficiency improvements in the public entities' processes or delivery of services, considering, among other things, the probable scope, complexity or priority of the project. Determinations may also be made regarding risks sharing including guaranteed costs of completion; added value or debt or equity investments proposed by the private entity; or increase in funding, dedicated revenue source or other economic benefits that would not otherwise be available. (See Department of General Services, *Guidelines and Procedures, revised January 17, 2008*)

Municipal Public Utility Model

In this model, the local government builds and controls all aspects of the network and is the sole service provider operating it as a public utility. This is particularly prevalent in communities where there are existing municipal owned electric and power systems. Such is the case with broadband deployment in Bristol.

The city of Bristol, Virginia operates the first government-owned public utility – Bristol Virginia Utilities or BVU – in the nation to deploy a fiber-to-the-user (FTTU) network that offers the triple play of services (digital phone, video and data). The utility invested millions of dollars in its network, called OptiNet, based on the realization that only a fiber network would be capable of meeting future bandwidth demands of businesses and consumers.

BVU operates as the government enterprise fund for the city of Bristol Virginia, providing electric, water, wastewater and fiber-optic telecommunications and information services to residents. The utility is governed by a seven-member BVU Board, appointed by Bristol Virginia City Council, and has revenues of about $77 million a year.

Project Financing

Information relating to grant financing from the Tobacco Commission, the Virginia Department of Housing and Community Development, and USDA's Rural Development Rural Utilities Program is included in the Broadband Roundtable Report.

In 2007 and 2008, the Virginia General Assembly expanded projects eligible for financing through the Virginia Resources Authority (VRA) first with wireless broadband deployment projects and in 2008 with any type of technology used for broadband deployment. Since its inception almost 25 years ago, VRA has invested over $3.4 billion in local communities for over 800 critical public projects. Its cost-effective financing has accelerated many public projects and has made many more possible (see VRA Slide Presentation: *Funding Source for Broadband Deployment*, September, 2009)

VRA is able to provide cost-effective financing for any technology, infrastructure, and equipment for broadband projects. *With several different financing options, funds can be made available to meet any borrower and project timeframe: Short-Term, Pooled Bond or Equipment and Term Financing Programs.*

VRA's applications process is relatively simple and its staff is available to assist local governments in all aspects of the loan transaction.

A VRA borrower does not need a credit rating of its own to obtain a loan from VRA, nor is it necessary to purchase bond insurance or other credit enhancement to make its bonds more attractive to investors. This is particularly helpful and saves substantial money, especially for newly created authorities (including wireless service authorities with no credit history or rating). VRA is able to provide financing to these newly established entities with the same cost-effective terms provided other established borrowers.

VRA's *Short-Term Financing* options provide funds whenever they are needed. VRA custom tailors the financing solutions to the need of each borrower and performs all loan underwriting in-house (versus passing it through to banks or investors). Hence, the best terms and rates can be obtained to meet the needs of the community

VRA's *Pooled Financing Program* enables local governments to save money through economies of scale and VRA's strong credit ratings, Natural "AAA/AA" from Moody's and Standard & Poor's. Furthermore, VRA borrowers maintain flexibility and control over their local debt and refinancing opportunities are continuously monitored in-house.

VRA's *Equipment and Term Financing Program* provides financing for terms up to 15 years. VRA's statewide "master contract" provides very favorable rates. This program is ideally suited for localities transitioning from "pay-as-you-go" policies for such purchases as telecommunications and other equipment.